

CLAIMS

1. A method for monitoring performance of an optical communication link, said method comprising:
- 5 at a first intermediate location along said link, separating a portion of an optical signal traveling along said link to form a first measurement optical signal; detecting said first measurement optical signal to form a first measurement electrical signal; and
- 10 performing error correction decoding on said first measurement electrical signal to generate an indication of correct receipt of data at said first intermediate location.
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2. The method of claim 1 further comprising: using said indication of correct receipt of data at said first location to determine a fault along said link prior to said first intermediate location.
3. The method of claim 1 wherein said optical signal comprises a WDM signal and separating comprises:
- 15 isolating a portion of a particular wavelength component of said optical signal.
- 20 4. The method of claim 1 further comprising: at a second location along said link, separating a portion of an optical signal traveling along said link to form a second measurement optical signal;

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detecting said second measurement optical signal to form a second measurement electrical signal; and

5 performing error correction decoding on said second measurement electrical signal to generate an indication of correct receipt of data at said second intermediate location.

5. The method of claim 4 further comprising:

10 using said indications of correct receipt of data at said first intermediate location and at said second intermediate location to locate a fault along said link prior to said second intermediate location.

6. Apparatus for monitoring performance of an optical communication link at an intermediate location along said link, said apparatus comprising:

15 a coupler that separates a portion of an optical signal traveling along said link; an optical receiver that recovers data based on said portion of said optical signal; an error correction decoding circuit that identifies errors in receipt of said data; and

20 a link verification stage that generates an indication of link operation based on errors identified by said error correction decoding circuit.

7. The apparatus of claim 6 further comprising:

a filter that isolates a particular wavelength component of said portion of said optical signal for input to said optical receiver.

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8. The apparatus of claim 7 further comprising:
an optical amplifier that boosts portion of said optical signal.
 - 5 9. The apparatus of claim 7 wherein said filter comprises a tunable filter.
 10. The apparatus of claim 9 wherein said link verification stage tunes said tunable filter to test a selected wavelength component.
 - 10 11. The apparatus of claim 6 wherein said optical receiver comprises:
a photodetector circuit that generates an electrical signal based on said portion of said optical signal; and
a demodulator that recovers data from said electrical signal.
 - 15 12. A system for locating a fault along an optical communication link, said system comprising:
a first link monitor that monitors performance of said link at a first intermediate location along said link; and
a second link monitor that monitors performance of said link at a second intermediate location along said link; and
20 wherein each of said first link monitor and said second link monitor comprise:
a coupler that separates a portion of an optical signal traveling along said link;

an optical receiver that recovers data based on said portion of said optical signal;

5 an error correction decoding circuit that identifies errors in receipt of said data; and

 a link verification stage that generates an indication of link operation based on errors detected by said error correction decoding circuit.

13. The system of claim 12 wherein a fault is located based on said indications of link

10 operation from said first link monitor and said second link monitor.

14. The system of claim 12 wherein each of said first link monitor and said second link monitor further comprise:

15 a filter that isolates a particular wavelength component of said portion of said optical signal for input to said optical receiver.

15. The system of claim 14 wherein said filter comprises a tunable filter.

16. The system of claim 12 wherein said optical receiver comprises:

20 a photodetector circuit that generates an electrical signal based on said portion of said optical signal; and

 a demodulator that recovers data from said electrical signal.

17. Apparatus for monitoring performance of an optical communication link at an intermediate location along said link, said apparatus comprising:

means for separating a portion of an optical signal traveling along said link;

5 means for recovering data based on said portion of said optical signal;

means for identifying errors in receipt of said data; and

means for generating an indication of link operation based on errors detected by
said error identifying means.

10 18. The apparatus of claim 17 further comprising:

means for isolating a particular wavelength component of said portion of said
optical signal for input to said recovering means.

15 19. The apparatus of claim 18 wherein said isolating means comprises a tunable filter.

20. The apparatus of claim 19 wherein said generating means tunes said tunable filter
to test a selected wavelength component.

21. The apparatus of claim 17 wherein said recovering means comprises:

20 a photodetector circuit that generates an electrical signal based on said portion of
said optical signal; and

a demodulator that recovers data from said electrical signal.

22. A method for locating a fault on an optical link, said method comprising:

receiving indications of whether an optical signal is received successfully from a plurality of monitor locations along an optical link; and

5 determining a location of said fault to be beyond a last monitor location receiving said optical signal successfully.

23. Apparatus for locating a fault on an optical link, said apparatus comprising:

means for receiving indications of whether an optical signal is received successfully from a plurality of monitor locations along an optical link; and

10 means for determining a location of said fault to be beyond a last monitor location receiving said optical signal successfully.

24. A computer program product for locating a fault on an optical link, said product comprising:

15 code that causes reception of indications of whether an optical signal is received successfully from a plurality of monitor locations along an optical link;

code that causes a location of said fault to be determined to be beyond a last monitor location receiving said optical signal successfully; and

a computer-readable storage medium that stores the codes.

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25. Apparatus for locating a fault on an optical link, said apparatus comprising:

a processor that executes instructions;

a computer-readable storage medium that stores said instructions, said instructions comprising:

code that causes reception of indications of whether an optical signal is received successfully from a plurality of monitor locations along an optical link; and

- 5 code that causes a location of said fault to be determined to be beyond a last monitor location receiving said optical signal successfully.

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